

CLAIMS

1. Cathodic protection device for a subsea flexible pipe (1) for transporting fluid, the flexible pipe comprising a plastic sealing sheath (2) and an inner plastic sheath (8) which define an annular space in which structural elements are placed, the said structural elements comprising at least one armour ply (3) consisting of metal wires (41) wound helically with a long pitch, a end fitting (12, 13) being fitted at each end of the said flexible pipe (1), the device (14) comprising at least one external anode (17) electrically connected by connection means to the said armour ply, characterized in that the anode (17) is placed in an intermediate region (40) of the flexible pipe (1) distal from the said end fittings, the connection means (23, 25) connecting the anode to at least one of the metal wires in the said intermediate region.
2. Cathodic protection device according to Claim 1, characterized in that the armour ply (4) connected to the anode is adjacent to the outer plastic sealing sheath (2).
3. Device according to Claim 1, in which the flexible pipe comprises several armour plies (4, 5) and characterized in that the anode is electrically connected to at least one single metal wire (41) of each armour ply (4, 5).
4. Device according to one of Claims 1 to 3, characterized in that the connection means (23, 25) consist of at least one penetrating metal shank

(22) which is in contact with the metal wire or wires (41) to be connected to the anode (17).

5. Device according to one of Claims 1 to 4, characterized in that the anode (17) is fastened to a clamp (15) which is clamped around the flexible pipe (1).
10. Device according to Claim 5, characterized in that the clamp (15) comprises a penetrating internal part (25) which is in contact with the metal wire or wires (41) to be connected to the anode.
15. Device according to Claim 5, characterized in that the clamp (15) comprises several penetrating bolts (23) uniformly distributed around the periphery of the flexible pipe (1) and each constituting one of the connection means.
20. 8. Device according to Claim 7, characterized in that contact between the lower end of each bolt (23) on an armour wire (41) is provided by brazing, welding or adhesive bonding using a conductive adhesive.
25. 9. Device according to Claims 1 to 3 and 7, characterized in that at least the outermost armour ply (4) comprises at least one tapped part (21) into which a threaded shank of one of the bolts (23) is inserted by screwing.
30. 10. Device according to either of Claims 1 and 3, characterized in that when the flexible pipe comprises several armour plies (4, 5) separated by insulating intermediate tapes (11), the connection

means connect the anode (17) to the innermost armour ply (5) lying beneath the last insulating tape (11).

5 11. Device according to Claim 10, characterized in that the penetrating connection means provide contact with each armour ply of the flexible pipe through which they pass.

10 12. Device according to Claim 1, characterized in that an anode (17), which is fastened to a first support clamp (29), is fitted in the intermediate region (40), the connection between the anode (17) and at least one metal wire (41) being made 15 through a second connection clamp (31) located near the first clamp (29).